



Operating Instructions

Exicom Falcon ET-125-A

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1 Preface

These operating instructions are intended for the safe installation of the Falcon ET-125-A operator interfaces and cover all Ex-relevant aspects. Furthermore, these operating instructions contain all necessary information for assembly and connection of the operator interfaces.



For the correct operation of all associated components please note, in addition to these operating instructions, all other operating instructions enclosed in this delivery as well as the operating instructions of the additional equipment to be connected.

2 Device function

The ET-125-A operator interfaces are intelligent operating and monitoring devices with text or graphic display for use in hazardous environments of zones 1, 2, 21 and 22 according to ATEX guideline 94/9/EC.

The ET-125-A operator interfaces offer a wide range of types of graphic display. A great variety of integrated functions also means less work for your PLC.

The new ET-125-A with stainless steel housing may be mounted inside an additional housing of protection type "e" (increased safety) or dust ignition protection type "tD" without these protection types being compromised.

3 Technical Data

| | | | | | | | | |
|--|---|------|-------|-------|--------|---------|----------|----------|
| Function / Equipment | ET-125-A | | | | | | | |
| Certification / Testing | | | | | | | | |
| ATEX | BVS 03 ATEX E 226 | | | | | | | |
| Protection type / Ex classification | | | | | | | | |
| ATEX | Ⓔ II 2 G Ex ia IIC/IIB T4/T3 Gb Ⓔ II 2 D Ex ia IIIC T70°C/80°C Db | | | | | | | |
| CE number | C € -0158 | | | | | | | |
| Display type | LCD monochrome graphic display | | | | | | | |
| | Contrast adjustment using key combination | | | | | | | |
| Display size | 114 x 64 mm | | | | | | | |
| Resolution | 240 x 128 pixels | | | | | | | |
| Display | Glass panel | | | | | | | |
| Backlight | LED background lighting | | | | | | | |
| Service life of backlight at 25°C | approx. 50,000 h | | | | | | | |
| Keyboard | Polyester membrane on FR4 material; > 1 million actions | | | | | | | |
| Functional keys | 16 | | | | | | | |
| custom labelling | Yes | | | | | | | |
| Soft keys | 8 | | | | | | | |
| Cursor keys | Yes | | | | | | | |
| Alphanumeric keys and system keys | 23 | | | | | | | |
| System LED's | 5 (STOP, COM, ONLINE, ALARM, INFO) | | | | | | | |
| Key LED's, controllable | 12 | | | | | | | |
| Total binary inputs / electrical parameters | 8 floating contacts, switches/ pushbuttons / 3.3 V, 2 mA each | | | | | | | |
| Real time clock / Data buffer | Yes (capacitor buffered, maintenance-free) / > 4 days | | | | | | | |
| Interfaces | | | | | | | | |
| Communication | RS-422 (bus-compatible) connection to 9185/11 | | | | | | | |
| Fieldbus | MPI with MPI Box SSW7-RK512-RS-232 | | | | | | | |
| | Profibus with 9185/11-46-10 | | | | | | | |
| Ethernet | TCP/IP or UDP with 9185/11-45-xx and SK-Cobox | | | | | | | |
| Reader unit interface (optional via additional module) | Barcode scanner, Wiegand reader, Proximity reader interface | | | | | | | |
| Processor | Winbond W77IC32P | | | | | | | |
| Configuration memory type | Flash EEPROM | | | | | | | |
| Program memory size [kByte] | 8x64 (512) flash RAM | | | | | | | |
| Main memory, buffered [kByte] | 128 (> 4 days) | | | | | | | |
| Record memory [kByte] | 12 / ca. 200 - 700 messages | | | | | | | |
| Conf. memory size [kByte] | 448 | | | | | | | |
| Number of protocol drivers | 3 (loadable via PC software) | | | | | | | |
| Operating system: | SPSPlusWIN | | | | | | | |
| Language support | 4 system languages (German, English, French, Dutch) | | | | | | | |
| Number of process images | 100 / 20 bitmaps per language | | | | | | | |
| Number of texts / messages | Max. 5900 | | | | | | | |
| Number of fault messages | 512 (bit controlled) | | | | | | | |
| Font sets | 3 (freely definable) | | | | | | | |
| | IBM code table, 437 predefined in 3 sizes | | | | | | | |
| Predefined Fonts | 6x8 | 6x12 | 12x21 | 18x32 | CYR6x8 | CYR6x12 | CYR12x21 | CYR18x32 |
| Number of lines | 16 | 10 | 6 | 4 | 16 | 10 | 6 | 4 |
| Number of characters/ line | 40 | 40 | 20 | 13 | 40 | 40 | 20 | 13 |
| Character height [ca. mm] | 6 | 6 | 10 | 15 | 6 | 6 | 10 | 15 |
| Power supply | 10.8 VDC, 8 – 12.5 VDC via 9143/10 power supply | | | | | | | |
| Current consumption [mA] | Max. 180 | | | | | | | |
| Connections | Via plug-in screw terminals, 2.5 mm ² green | | | | | | | |
| Housing | Front: aluminium with polyester membrane, seal, IP 65 Back: stainless steel, IP 20 | | | | | | | |

| | |
|------------------------------------|--|
| Ambient temperature, operation | -20...+70°C (+60°C at T4) |
| Storage temperature | -30...+80°C |
| Relative humidity | 90% at 40 °C, without condensation |
| Vibration | Operation: 3 to 22Hz: 1mm 22 to 500Hz: $9.8\text{m/s}^2 = 1\text{g}$ Transport: 3 to 9Hz: 3.5mm 9 to 500Hz: $9.8\text{m/s}^2 = 1\text{g}$ |
| Shock loading | Operation: $150\text{m/s}^2 = \text{about } 15\text{g} / 11\text{ms}$ Transport: $250\text{m/s}^2 = \text{about } 25\text{g} / 6\text{ms}$ |
| Dimensions w x h [mm] | 312 X 202 |
| Cut-out w x h [mm] (+/- 0.5) | 300 x 180 |
| Mounting depth [ca. mm] | 80 |
| Wall thickness [mm] | <10 |
| Installation space [approx. in mm] | 392 x 282 x 96 |
| Weight [g] | approx. |

4 Conformity to standards

The operator interfaces comply with the following standards and directives:

| Standard | Classification |
|--------------------------------------|--|
| Directive 94/9/EC | |
| 4. Supplement | |
| EN 60079-0 : 2009 | General requirements |
| EN 60079-11 : 2007 | Intrinsic safety "i" |
| EN 61241-11 : 2006 | Protected by enclosures "tD" (dust) |
| Electromagnetic compatibility | |
| Directive 2004/108/EC | |
| EN 61000-6-2 (2006) | Interference resistance |
| EN 61000-6-4 (2007) | Interference emission industry |

5 Certificates

The Falcon ET-125-A operator interfaces are certified for installation in the following areas:
according to ATEX Directive 94/9/EC

for installation in zones 1, 2, 21 and 22


5.1 ATEX

The ATEX certification has the following number:

Certificate number:

BVS 03 ATEX E 226

6 Marking

| | | | |
|---|---|--|--|
| Manufacturer | R. STAHL HMI Systems GmbH | | |
| Type code: | ET-125-A | | |
| CE classification: | CE 0158 | | |
| Testing authority and certificate number: | BVS 03 ATEX E 226 | | |
| Ex classification: |  | | |
| ATEX guideline 94/9/EC | | II 2 G Ex ia IIC/IIB T4/T3 Gb II 2 D Ex ia IIIC T70°C/80°C Db | |

7 Power supply

| Power supply | | | Power consumption |
|--------------------------|---------------|----------|-------------------|
| minimum | Rated voltage | maximum | maximum |
| 8 VDC | 10.8 VDC | 12.4 VDC | 180 mA |
| Backlight power supply | | | |
| 8 VDC | 10.8 VDC | 12.4 VDC | 140 mA |
| Card reader power supply | | | |
| 8 VDC | 10.8 VDC | 12.4 VDC | 180 mA |

8 Permitted maximum values

8.1 Connection X1, supply

Terminals 1 and 2:

| Power supply operator interface | | | | |
|---------------------------------|-------|---|------------|------|
| Voltage | U_i | = | 12.4 | V DC |
| Current | I_i | = | 200 | mA |
| Effective internal capacitance | C_i | = | negligible | |
| Effective internal inductance | L_i | = | negligible | |

Terminals 3 and 4:

| Backlight power supply | | | | |
|--------------------------------|-------|---|------------|------|
| Voltage | U_i | = | 12.4 | V DC |
| Current | I_i | = | 200 | mA |
| Effective internal capacitance | C_i | = | negligible | |
| Effective internal inductance | L_i | = | negligible | |

8.2 Connection X2, communication

| Communications interface | | | | |
|--------------------------|-------|---|------|----------|
| Voltage | U_o | = | 5.88 | V DC |
| Current | I_o | = | 40 | mA |
| Internal resistance | R_i | | 147 | Ω |

For group IIC

| | | | | |
|---------------------------|-------|---|----|---------|
| Max. external capacitance | C_o | = | 43 | μF |
| Max. external inductance | L_o | = | 30 | mH |

The following values apply in the case of combined capacitances and inductances:

| | | | | |
|-----------------------------|-------|---|-----|---------|
| Max. external capacitance | C_o | = | 2.7 | μF |
| At max. external inductance | L_o | = | 1 | mH |

For group IIB

| | | | | |
|---------------------------|-------|---|------|---------|
| Max. external capacitance | C_o | = | 1000 | μF |
| Max. external inductance | L_o | = | 85 | mH |

The following values apply in the case of combined capacitances and inductances:

| | | | | |
|-----------------------------|-------|---|----|---------|
| Max. external capacitance | C_o | = | 15 | μF |
| At max. external inductance | L_o | = | 1 | mH |

For the connection of intrinsically safe circuit with the following maximum value:

| | | | | |
|--------------------------------|-------|---|------------|------|
| Voltage | U_i | = | 8 | V DC |
| Effective internal capacitance | C_i | = | negligible | |
| Effective internal inductance | L_i | = | negligible | |

8.3 Connection X5, input

| Digital input | | | | |
|--|-------|---|------|------|
| Connection of passive keys / switches, max. 2m cable | | | | |
| Voltage | U_o | = | 5.88 | V DC |
| Current | I_o | = | 40 | mA |

8.4 Connection X7, readers

Terminals 1 and 2:

| Power supply input | | | | | |
|--------------------------------|-------|---|------------|------|------------|
| | Type | | WCR1 | | RSi1 |
| Voltage | U_i | = | 12.4 | V DC | 12.4 V DC |
| Current | I_i | = | 200 | mA | 220 mA |
| Effective internal capacitance | C_i | = | negligible | | negligible |
| Effective internal inductance | L_i | = | negligible | | negligible |

Terminals 9 and 3:

Output power supply circuit for types WCR1 or RSi1

The values for voltage U_o and power I_o . The power P_o , the maximum external inductance L_o , and the capacitance C_o , depend on the supply to terminals 1 and 2.

Terminals 3 and 4:

| Power supply readers | | | | | |
|--|-------|---|------|---------|-------------|
| Die Klemmen 3 und 4 sind potentialmäßig mit den Klemmen 1 und 2 verbunden. | | | | | |
| | Type | | WCR1 | | RSi1 |
| Voltage | U_o | = | 5.88 | V DC | 5.4 V DC |
| Max. current * | I_o | = | 200 | mA | 220 mA |
| Internal capacitance | C_i | = | 4.6 | μF | 4.2 μF |
| Internal inductance | L_i | = | 100 | nH | 100 nH |

- * I_o depends on the power supply connected to terminals 1 and 2 and cannot exceed the above value.

WCR1:

A current of $I_o = 200$ mA results in the following external values:
For group IIC

| | | | | |
|---------------------------|-------|---|------|---------|
| Max. external capacitance | C_o | = | 38 | μF |
| Max. external inductance | L_o | = | 0.07 | mH |

The following values apply in the case of combined capacitances and inductances:

| | | | | |
|-----------------------------|-------|---|------|---------|
| Max. external capacitance | C_o | = | 0.6 | μF |
| At max. external inductance | L_o | = | 0.05 | mH |

For group IIB

| | | | | |
|---------------------------|-------|---|------|---------------|
| Max. external capacitance | C_o | = | 1000 | μF |
| Max. external inductance | L_o | = | 2 | mH |

The following values apply in the case of combined capacitances and inductances:

| | | | | |
|-----------------------------|-------|---|-----|---------------|
| Max. external capacitance | C_o | = | 3.9 | μF |
| At max. external inductance | L_o | = | 1 | mH |

RSi1:

A current of $I_o = 220 \text{ mA}$ results in the following external values:

For group IIC

| | | | | |
|---------------------------|-------|---|-----|---------------|
| Max. external capacitance | C_o | = | 60 | μF |
| Max. external inductance | L_o | = | 0.1 | mH |

The following values apply in the case of combined capacitances and inductances:

| | | | | |
|-----------------------------|-------|---|------|---------------|
| Max. external capacitance | C_o | = | 1.8 | μF |
| At max. external inductance | L_o | = | 0.05 | mH |

For group IIB

| | | | | |
|---------------------------|-------|---|------|---------------|
| Max. external capacitance | C_o | = | 1000 | μF |
| Max. external inductance | L_o | = | 2 | mH |

The following values apply in the case of combined capacitances and inductances:

| | | | | |
|-----------------------------|-------|---|-----|---------------|
| Max. external capacitance | C_o | = | 5.1 | μF |
| At max. external inductance | L_o | = | 1 | mH |

Terminals 5 to 8:

| Singal input / output | | | | | |
|---|------------------|------------|------|------------|------|
| | Type | WCR1 | | RSi1 | |
| Voltage | U _o = | 5.88 | V DC | 5.4 | V DC |
| Current | I _o = | 56 | mA | 49 | mA |
| Power | P _o = | 83 | mW | 62 | mW |
| Max. external capacitance | C _o = | 43 | μF | 65 | μF |
| Max. external inductance | L _o = | 16 | mH | 14 | mH |
| For the connection of an intrinsically safe circuit with the following maximum value: | | | | | |
| Voltage | U _o = | 15 | V DC | 15 | V DC |
| Current | I _o = | 500 | mA | 500 | mA |
| Power | P _o = | 2.5 | W | 2.5 | W |
| Effective internal capacitance | C _o = | negligible | | negligible | |
| Effective internal inductance | L _o = | negligible | | negligible | |

9 Ambient temperature range

The ambient temperature range T_a is:

T4 -20°C to +60°C

T3 -20°C to +70°C

☞ For functional reasons, the lower temperature stated here differs by 5°C from that stated on the Examination Certificate.
For operation, - 20°C apply !


The maximum surface temperature for the temperature ranges is:

T4 70°C

T3 80°C

10 Type code

Type code:

Exicom ET-xxx-A
 125

Product type:

| Order number | Description |
|-----------------------|--|
| ET-125-A-RS422 | Standard version |
| ET-125-A-RS422-RSi | Operator interface with RSi (type RSi1) interface for barcode or transponder reader |
| ET-125-A-RS422-WCR | Operator interface with WCR (type WCR1) interface for Wiegand reader |
| ET-125-A-TAS-WCR-Pack | Complete package, consisting of: 8125/5086-6 stainless steel housing dimensions (WxHxD) 360 x 360 x 230 mm, complete with add-ons and wiring (plug-in) - ET-125-A-RS422-WCR operator interface - WCRI-HID-Swipe Wiegand card swipe reader mounted on the side - 3 x Ex-d housing 8510/122-20-002-00 with in-built 9143 power supply - 2 x UT 2.5 terminal blocks (power supply) - 1 x UT 2.5 PE terminal block (power supply) - 8 x UT 2.5 blue terminal blocks (data signals) - 1 x 8161 M20 cable gland (power supply) - 2 x 8161 M20 blue cable gland (data signals) |

11 Safety Advice

This chapter is a summary of the key safety measures. The summary is supplementary to existing rules which staff also have to study.

The safety of persons and equipment in hazardous areas depends on compliance with all relevant safety regulations. Thus, the installation and maintenance staff carry a particular responsibility, requiring precise knowledge of the applicable regulations and conditions.

11.1 Installation and operation

Please note the following when installing and operating the device:

- The national regulations for installation and assembly apply (e.g. EN 60079-1).
- The operator interfaces may be installed in zones 1, 2, 21 or 22.
- The operator interfaces must be integrated into the system's equipotential bonding.
- The intrinsically safe circuits must be installed according to applicable regulations.
- The operator interface must only be switched on when it is closed.
- When installed in zones 1, 2, 21 and 22, intrinsically safe devices suitable for zones 1, 2, 21 and 22 may be connected to the intrinsically safe power supply circuits.
- The safe maximum values of the connected field device(s) must correspond to the values listed on the data sheet or the EC type examination certificate.
- Interconnecting several active devices in an intrinsically safe circuit may result in different safe maximum values. This could compromise intrinsic safety !
- National safety and accident prevention rules.
- Generally accepted technical rules.
- Safety instructions contained in these operating instructions.
- Any damage may compromise the explosion protection !

Use the device for its intended purpose only (see "Function").

Incorrect or unauthorized use and non-compliance with the instructions in this manual will void any warranty on our part.

No changes to the device that compromise its explosion protection are permitted !

The device may only be installed and operated in an undamaged, dry and clean condition !



Damage may compromise Ex-protection. In the case of visible damage, the device must be returned to the manufacturer for repair.

11.2 Special conditions

for installation in:

11.2.1 Zone 21

- During assembly and operation of the operator interface electrostatic surface charging must not exceed that caused by manual rubbing.
- If the operator interface is installed in **Zone 21**, the housing **must not** be opened in explosive atmosphere.
- If the operator interface is mounted inside R. STAHL AG's type 8146 plastic housing, the ambient temperature range is -20°C to $+55^{\circ}\text{C}$.

If you intend to mount the operator interface in a different housing please note the following conditions:

- The housing must be a group IIIC certified housing.
- It must be certified for installation in temperature range $T \geq 70^{\circ}\text{C}$ or $T \geq 80^{\circ}\text{C}$.
- If the housing is **NOT** certified for installation in temperature range $T \geq 70^{\circ}\text{C}$ or $T \geq 80^{\circ}\text{C}$, an individual type plate must be attached to the housing specifying the permitted ambient temperature range for this housing.


11.2.2 Zone 22

- During installation it must be ensured that all seals of the contact surfaces are in order and that at least protection type IP54 according to EN 60529 is achieved after installation.
- All cable glands at the housing have to comply with the requirements of current standards.

12 Ex-i power supply 9143

12.1 Function

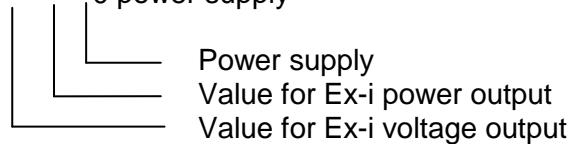
The Ex-i power supplies are used to provide intrinsically safe power to the operator interfaces and their accessories.

 For all Ex- and safety-relevant information, technical data, the EC type examination certificate and the declaration of conformity please refer to the operating instructions of the 9143 power supply.

12.2 Type code

Type code:

9143/10-***-***-*0 power supply




Product type:

| Version | Power supply |
|---------------------------------|---------------|
| 9143/10-114-200-10 power supply | 24 V AC/DC |
| 9143/10-114-200-20 power supply | 85...230 V AC |

13 Fieldbus Isolator 9185

13.1 Function

The 9185/11 fieldbus isolater is used to isolate the intrinsically safe RS-422 interface of the operating interfaces from a non-intrinsically safe RS-232, RS-422 or RS-485 interface. The 9185/11 fieldbus isolater can also be used to transform different types of interfaces.

 For all Ex- and safety-relevant information, technical data, the EC type examination certificate and the declaration of conformity please refer to the operating instructions of the 9185/11 fieldbus isolator..

14 Installation and operation

14.1 General information

Electrical plants are subject to certain regulations concerning installation and operation (e.g. RL 1999/92/EC, RL 94/9/EC, ElexV, IEC/EN 60079-14 and VDE 0100).

It is the responsibility of the operators of electrical installations in hazardous environments to ensure that the equipment is kept in proper condition, is operated according to instructions and that maintenance and repairs are carried out (ElexV and EN 60079-14).

14.2 ET-125-A

- The operator interfaces may be installed in zones 1, 2, 21 or 22. The intrinsically safe circuits must be installed according to applicable regulations.
- Intrinsically safe and non intrinsically safe conducting connection parts must be installed with a minimum distance of 50 mm.
- The operator interfaces have protection type IP65 and must therefore be protected from adverse environmental conditions such as splashed water or dirt exceeding pollution degree 2.
- Operators must ensure compliance with the EC type examination certificates before installation. Users must adhere to any "special conditions" therein. Also of importance are the maximum electrical operating values specified therein.
- When connecting the operator interfaces to the intrinsically safe circuits of the associated equipment the respective maximum values of the field unit and the associated equipment must be observed to ensure explosion protection (proof of intrinsic safety).
- The Ex-i terminals may also be connected to live equipment.
- The external PA/⏏ connection is subject to the installation regulations and may therefore have to be connected to the equipotential bonding system. A connection is provided on the back of the operator interface's housing for this purpose.
- The PA connector must be connected to the equipotential bonding conductor of the hazardous area.
- The new ET-125-A with stainless steel housing may be mounted inside an additional, suitable housing of protection type "e" (increased safety) or dust ignition protection type "tD" without these protection types being compromised.

15 Assembly and disassembly

15.1 General information

Assembly and disassembly are subject to general technical rules. Additional, specific safety regulations apply to electronic and pneumatic installations. In Germany, for example, these include the BGI 547 (Information on and principles of workplace safety and health issued by the Government Safety Association) and the BetrSichVer (Betriebsicherheitsverordnung - Occupational Safety and Health).

15.2 ET-125-A

When operating the devices, particular care shall be taken that:

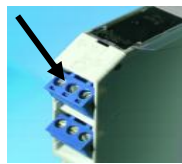
- the operator interface has been properly installed according to instructions,
- the device is undamaged,
- the terminal compartment is clean,
- all screws are tightened fast,
- where necessary, the device's external bonding terminal is properly connected to the equipotential bonding system at its place of use.

15.3 Ex-i power supply 9143

Mounting position: any

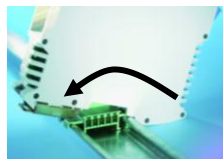
a) Detachable terminals

All devices are fitted with detachable terminals. The terminals can be detached by means of a screwdriver, for example.



b) Mounting on DIN rails in accordance with EN 50022

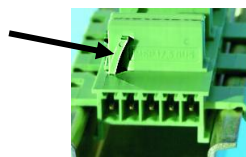
Place the device on the DIN rail and tilt/snap onto the rail as shown below. Do not tilt to either side when mounting. To dismount, gently loosen the lock on the mounting foot with a screwdriver and then remove the module.



c) Mounting on DIN rails with a pac-bus already installed (only 9143/10-...-10)

As shown below, place the device on the pac-Bus and tilt/snap until it locks in. Do not tilt to either side when mounting.







Please note: in order to prevent pole reversal during installation, the pac-Bus elements are fitted with a polarisation guide (see below) and the module is fitted with a matching slot.



Dismount as described in section b) above.

15.3.1 Maximum ambient temperatures

The devices of the IS pac series may be used within a wide temperature range. The maximum ambient temperature range depends on the design and installation conditions.

| | Mounting position: | DIN-rail | max. temperature |
|-------------------------|---|---|------------------|
| without air circulation | <u>Single device:</u> horizontal vertical |  | 70 60 |
| | horizontal |  | 70 |
| | vertical |  | 60 |
| With air circulation | <u>Single device</u> horizontal vertical |  | 70 |
| | horizontal |  | 70 |
| | vertical |  | |

15.3.2 Calculation of power dissipation in control cabinets

If devices are mounted inside control cabinets the free circulation of air will be restricted, and the temperature will rise as a result. To keep the temperature increase at a minimum it is important to optimize the power dissipation as well as the generated heat.

a) Natural convection in closed cabinets

- Application: if power dissipation is low and if the system is installed in a dusty or rough environment.
- Calculation of the maximum permitted power dissipation:

$$P_{\max} = \Delta t * S * K$$

P_{\max} [W] max. permitted power dissipation inside control cabinet

Δt [°C] max. permitted temperature increase

S [m²] free, heat-emitting surface of the control cabinet

K [(W/m²*°C)] thermal conductivity coefficient (coated steel: $K = 5.5$)

The calculated value P_{\max} must be less than the sum of the average power dissipation (70% of the maximum power dissipation) of the installed devices: $P_{\max} < \Sigma P_{70\%}$

a) Natural convection in open cabinets

- Function: the heat is displaced by cool airstreams between the devices.
- Conditions:
 - air vents at the top and bottom of the cabinet
 - the path of the airstream must not be obstructed
- Result: depending on the equipment **twice** the permitted maximum power dissipation under a) may be achieved.

c) Forced ventilation with heat exchanger in closed cabinets

- Application: if either the environment or the high power dissipation do not allow for natural convection.
- Function: a heat exchanger with ventilator sucks the air into the cabinet and forces it through the heat exchanger plates which are cooled with ambient air by a second ventilator.
- Result: Depending on the equipment **5 to 6 times** the permitted maximum power dissipation as under a) may be achieved.

d) Forced ventilation in open cabinets

- Function: One or several ventilator(s) generate an airflow from the lower cabinet vent, past the devices and out of the upper cabinet vent.
- Calculation of the required airflow:

$$Q = (3.1 * P_{70\%}) / \Delta t$$

Q (m³/h) required airflow

$P_{70\%}$ [W] generated power dissipation (70% of the maximum power dissipation)

Δt [°C] permitted temperature increase in the control cabinet

e) Air conditioning

- Application: in hot climates – a cabinet temperature equal to or less than the ambient temperature can be achieved.
- Function: application of a specific cooling machine system or the existing air conditioning system for cooling the cabinet.


15.4 Fieldbus Isolator 9185

As described above in section 15.3.

15.5 Cut-out ET-125-A

Make a cut-out with the following dimensions:

| Operator interface | Width | Height | Depth of cut-out | Material thickness |
|--------------------|----------------|----------------|------------------|--------------------|
| ET-125-A | 300.0 ± 0.5 mm | 180.0 ± 0.5 mm | max. 80 mm | up to 10 mm |

 Please ensure that sufficient space is left around the mounted device. How much space is required is specified in the chapter dealing with technical data.

16 Operation

16.1 Connections ET-125-A

| Terminal | Pin | Definition | Connection | |
|----------|-----|---|--|---------|
| X1 | 1 | Power supply operator interface +12 V DC | Power supply of the operator interface | |
| | 2 | Power supply operator interface GND 1 | | |
| | 3 | Power supply background lighting +12 V DC | | |
| | 4 | Power supply background lighting GND 2 | | |
| X2 | 1 | TxD-A | Serial Interface RS-422 | |
| | 2 | TxD-B | | |
| | 3 | RxD-A | | |
| | 4 | RxD-B | | |
| X5 | 1 | Input 1 | Key or switch * | |
| | 2 | Input 2 | | |
| | 3 | Input 3 | | |
| | 4 | Input 4 | | |
| | 5 | Input 5 | | |
| | 6 | Input 6 | | |
| | 7 | Input 7 | | |
| | 8 | Input 8 | | |
| | 9 | + 3.3 V DC | | |
| X7 | 1 | Power supply reader module +12 V DC | Card reader *** | |
| | 2 | Power supply reader module GND 3 | | |
| | 3 | Power supply card reader GND 4 | | |
| | 4 | Power supply card reader +5 V DC | | |
| | 5 | RxD | | D0 |
| | 6 | TxD | | LED |
| | 7 | RTS | | N.C. ** |
| | 8 | CTS | | D1 |
| | 9 | + 12 V DC (out) | | |

* The push-buttons or switches used must be suitable for at least $U \geq 6 \text{ V}$ and $I \geq 60 \text{ mA}$. The maximum nominal values are 3.3 V and 2 mA.

** Not connected

*** Depending on the type of assembly pins 5 to 9 of the X7 interface have a different configuration.

16.2 Connections 9143

| Power supply 9143/10-***-***-10 | | | |
|------------------------------------|------------------|-----------------------------|------------|
| Input | | Output (intrinsically safe) | |
| Connection (pin) | Definition | Connection (pin) | Definition |
| Connector | | | |
| 7 | + 24 V DC | 10 | Output 1+ |
| 8 | Functional earth | 11 | Output 1- |
| 9 | GND | 12 | N.C. ** |
| Pac Bus | | | |
| 1 | + 24 V DC | | |
| 2 | GND | | |
| 3, 4 | LF * | | |
| 5, 6 | N.C. ** | | |

☞ * Contacts 3 and 4 (LF) on the pac bus must be short-circuited!

| Power supply 9143/10-***-***-20 | | | |
|------------------------------------|------------------|-----------------------------|------------|
| Input | | Output (intrinsically safe) | |
| Connection (pin) | Definition | Connection (pin) | Definition |
| Connector | | | |
| 7 | 85...230 V AC | 10 | Output 1+ |
| 8 | Functional earth | 11 | Output 1- |
| 9 | 85...230 V AC | 12 | N.C. ** |

☞ ** Not connected

16.3 Connections 9185/11

| 9185/11-45-10 | |
|--------------------------------|-------------------|
| Connection (pin) | Definition |
| X1 RS-232 (non Ex-side) | |
| 2 | RxD |
| 3 | TxD |
| 5 | GND |
| 7 | RTS |
| 8 | CTS |
| X2 RS-422 (non Ex-side) | |
| 8 | TxD-A |
| 3 | TxD-B |
| 9 | RxD-A |
| 4 | RxD-B |
| X2 RS-485 (non Ex-side) | |
| 8 | A (-) |
| 3 | B (+) |
| X3 RS-422 (Ex-side) | |
| 8 | TxD-A |
| 3 | TxD-B |
| 9 | RxD-A |
| 4 | RxD-B |
| X3 RS-485 (Ex-side) | |
| 8 | A (-) |
| 3 | B (+) |
| Auxiliary power | |
| Pac Bus | |
| 1 | + 24V DC |
| 2 | GND |
| 3, 4 | LF * |
| 5, 6 | N.C. ** |
| Terminals | |
| 7 | U+ (+24V DC) |
| 8 | PA |
| 9 | U- (0V) (GND) |

16.3.1 Dip switch settings S1 and S2

| Switch | Abbreviation (front plate) | Position | Function |
|--------|-------------------------------|----------|---|
| S1-1 | RS2 | ON | RS-422 on the non Ex-side |
| | | OFF | RS-485 on the non Ex-side |
| S1-2 | SCAN | ON | If S1-1 = ON (RS-422): Transmitter RS-422 = scanning |
| | | | If S1-1 = OFF (RS-485): Transmitter RS-422 = constantly on |
| | | OFF | If S1-1 = ON (RS-422): RS-485 = bidirectional |
| | | | If S1-1 = OFF (RS-485): Transmitter RS-485 = switched off |
| S2-1 | RS3 | ON | RS-422 on Ex-side (field side) |
| | | OFF | RS-485 on Ex-side (field side) |
| S2-2 | - | - | Not Connected |

- Standard settings are:

S1-2 = OFF

S1-1 = ON

S2-2 = OFF

S2-1 = ON



16.3.2 Rotary encoder switch settings

| Rotary encoder switch * | |
|-------------------------|-----------|
| Switch setting | Baud rate |
| 1 | 1.2 K |
| 2 | 2.4 K |
| 3 | 4.8 K |
| 4 | 9.6 K |
| 5 | 19.2 K |
| 8 | 57.6 K |

* Any other switch settings are not valid for this operator interface !

16.3.3 Status LEDs

| LED | Abbreviation (front plate) | Colour | Definition |
|-----|-------------------------------|--------|---|
| 1 | PWR | green | Voltage supply OK |
| 2 | ERR | red | LED static on = short circuit |
| | | | LED flashing = baud rate search in automatic baud rate detection |
| 3 | RxD1 | green | Reception at RS-232 interface X1 |
| 4 | RxD2 | green | Reception at RS-422/485 interface, non Ex-side X2 |
| 5 | RxD3 | green | Reception at the RS-422/485 interface, field side X3 |

17 Maintenance, service

Associated equipment is subject to maintenance, service and testing according to guidelines 1999/92/EC, IEC 60079-19 and EN 60079-17 !

Because the transmission of the devices remains reliable and stable over long periods of time, regular adjustments are not required.

Repairs may only be carried out by the manufacturer !

System maintenance should focus on the following:

- a. Seal wear
- b. Monitor or front membrane damage
- c. All screws are tightened fast
- d. All cables and lines are properly connected and undamaged

17.1 Servicing

In accordance with IEC 60079-19 and EN 60079-17, operators of electric plants in hazardous areas are obliged to have them serviced by qualified electricians.

18 Troubleshooting

Devices operated in hazardous areas must not be modified. Repairs may only be carried out by qualified, authorized staff specially trained for this purpose.



Repairs may only be carried out by specially trained staff who are familiar with all basic conditions of the applicable user regulations and – if necessary – have been authorized by the manufacturer.

19 Disposal

Disposal of packaging and used parts is subject to regulations valid in whichever country the device has been installed.

The disposal of devices sold after August 13th, 2005, and installed in countries under the jurisdiction of the EU is governed by directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Under this directive, the devices are listed in category 9 (monitoring and control instruments).

We shall take back our devices according to our General Terms and Conditions.

19.1.1 ROHS directive 2002/95/EC

The prohibition of hazardous substances as detailed in directive 2002/95/EC (ROHS) does not apply to electronic equipment of categories 8 and 9, and is therefore not applicable to the equipment described in these operating instructions.

19.1.2 China ROHS labelling

According to new Chinese legislation in force since 01.03.2007, all devices containing hazardous substances must be labeled accordingly.

For the ET-125-A operator interfaces, the following conditions apply:

Names and contents of toxic or hazardous substances or elements:

| Part | Toxic or hazardous substances and elements | | | | | |
|---------------|--|-----------------|-----------------|-------------------------------------|--------------------------------------|---|
| Name | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr (VI)) | Polybrominated Biphenyls (PBB) | Polybrominated diphenyl ethers (PBDE) |
| Housing | O | O | O | O | O | O |
| all PCBs | O | O | O | O | O | O |
| Miscellaneous | O | O | O | O | O | O |

- O Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirements in SJ/T11363-2006.
- X Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part is below the limit requirements in SJ/T11363-2006.

20 Certificates



Starting with this issue, the chapter entitled "Certificates" will contain only the first page of the EC type examination certificate plus the first page of the most recent supplement.

All technical details contained in the EC type examination certificate are, however, part of these operating instructions.

The complete certificate can be downloaded from the homepage of R. STAHL HMI Systems GmbH or a copy can be ordered from R. STAHL HMI Systems GmbH.

20.1 Declaration of EC conformity

EG - Konformitätserklärung EC-Declaration of Conformity CE-Déclaration de Conformité



Wir/ We /Nous

R. STAHL HMI Systems GmbH

Im Gewerbegebiet Pesch 14

D-50767 Köln

erklären in alleiniger Verantwortung dass unsere Produkte:

declare under our sole responsibility that the products:

attestons sous notre responsabilité que les produits:

ET-125-A-xxx

gekennzeichnet:

marked:

marqué:



II 2G Ex ia IIC/IIB T4/T3 Gb

II 2D Ex ia IIIC T70°C/80°C Db

übereinstimmen mit der/den folgenden Norm(en) oder normativen Dokumenten:

are in conformity with the following standards or normative documents:

sont conformes aux normes ou aux documents normatifs suivants:

| Bestimmung der Richtlinie <i>Terms of the directive</i> <i>Prescription de la directive</i> | Titel und/oder Nr. sowie Ausgabedatum der Norm <i>Title and/or No. and date of issue of the standard</i> <i>Titre et/ou No. ainsi que date d'émission des normes</i> |
|--|---|
| 2004/108/EG: Elektromagnetische Verträglichkeit <i>2004/108/EC: Electromagnetic compatibility</i> <i>2004/108/CE: Compatibilité électromagnétique</i> | EN 61000-6-2 (03/2006) EN 61000-6-4 (09/2007) |
| 94/9/EG: Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen <i>94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres</i> <i>94/9/CE: Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles</i> | EN 60079-0:2009 EN 60079-11:2007 EN 61241-11:2006 |
| EG-Baumusterprüfbescheinigung Nr., ausgestellt durch benannte Stelle: <i>EC-Type Examination Certificate No., issued by notified body:</i> <i>Attestation d'examen CE de type No. exposé par organisme notifié:</i> | BVS 03 ATEX E 226 DEKRA EXAM GmbH Dinnendahlstraße 9 D-44809 Bochum |

Köln, den 08.02.2010

Ort und Datum

Place and date

lieu et date

Joachim Düren

Joachim Düren
Technical Director

Werner Bertges


Werner Bertges
Quality Manager

20.2 EC type examination certificate



Translation

- (1) **EC-Type Examination Certificate**
- (2) **- Directive 94/9/EC -**
Equipment and protective systems intended for use
in potentially explosive atmospheres
- (3) **BVS 03 ATEX E 226**
- (4) **Equipment:** Computer terminal type ET-**-RS422-***
- (5) **Manufacturer:** SAE-STAHl GMBH
- (6) **Address:** 50767 Köln, Germany
- (7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this type examination certificate.
- (8) The certification body of Deutsche Montan Technologie GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
 The examination and test results are recorded in the test and assessment report BVS PP 03.2142 EG.
- (9) The Essential Health and Safety Requirements are assured by compliance with:
 EN 50014:1997 + A1 – A2 General requirements
 EN 50020:2002 Intrinsic safety 'i'
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this certificate.
- (11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.
 Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate
- (12) The marking of the equipment shall include the following:

 **II 2G EEx ia IIC/IIB T4/T3**

Deutsche Montan Technologie GmbH

Bochum, dated 16th September 2003

Signed: Dr. Jockers

 Certification body

Signed: Dr. Eickhoff

 Special services unit

Page 1 of 4 of BVS 03 ATEX E 226

This certificate may only be reproduced in its entirety and without change

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49 234/3696-105 Fax +49 234/3696-110 E-mail zs-exam@dekra.com



Translation

4th Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate
BVS 03 ATEX E 226

Equipment: Computer terminal type ET-**-RS422-*** and type ET-**-A-***

Manufacturer: R. STAHL HMI Systems GMBH

Address: 50767 Köln, Germany

Description:

Computer terminal type ET-**-A-*** and type ET-**-A-***

The asterisks shall be replaced by letters and numbers in the full type marking to separate the individual variants:

Type ET-**-RS422-***

Type ET-**- A -***

marking of integrated reader interface:
RSi, WCRi1
numbers 65, 75 or 125 for the relevant variant

This supplement was issued as the circuits of computer terminal type ET-**-RS422-*** have been slightly modified.

Additionally, new variants of type ET-**-A-*** (metal enclosure) may also now be manufactured. These computer terminals may be mounted into enclosures of types of protection Ex e or Ex tD as they meet the requirements given for the enclosures.

Both variants have been tested according to the following standards:
EN 60079-0:2009, EN 60079-11:2007 and, EN 61241-11:2006.

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

| | |
|------------------|-------------------------------------|
| EN 60079-0:2006 | General requirements |
| EN 60079-11:2007 | Intrinsic safety 'i' |
| EN 61241-11:2006 | Protection by intrinsic safety 'iD' |

The marking of the equipment shall include the following:

 **II 2G Ex ia IIC/IIB T4/T3 Gb**
II 2D Ex ia IIIC T70°C/80°C Db

Page 1 of 5 of BVS 03 ATEX E 226 / N4

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DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49 234/3696-105 Fax +49 234/3696-110 E-mail zs-exam@dekra.com

21 Release notes

Version 02.03.18

- First edition of the ET-125-A operating instructions, based on the existing Falcon operating instructions
- New format of chapter headings
- New format of table of contents
- Changes to preface with comment on other operating instructions
- Document structure adapted to the current convention.
- "Device Function" text changed
- Addition of chapter 3 Technical Data, details in table format
- Update of Standards and Certifications
- Addition of chapter 8 "Permitted maximum values"
- Addition of chapter 9: "Ambient temperature range"
- Change to chapter 10: "Type key"
- Change to chapter 11 "Safety Advice"
- Change to chapter 18 "Maintenance, service"
- Inclusion of comment on certificates
- Update of certificates
- Stylistic changes

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